CLAIMS

What is claimed is:

1. A carbamoyl ester that inhibits a cholinesterase, comprising an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent.

2. The carbamoyl ester of Claim 1, wherein hydrolysis occurs by reaction with an enzyme.

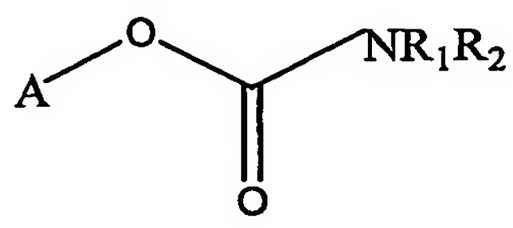
3. The carbamoyl ester of Claim 2, wherein the enzyme is a cholinesterase.

4. The carbamoyl ester of Claim 3, wherein the cholinesterase is a acetylcholinesterase.

5. The carbamoyl ester of Claim 3, wherein the cholinesterase is a butylrylcholinesterase.

6. The carbamoyl ester of Claim 1, wherein hydrolysis occurs by reaction with an acid.

7. The carbamoyl ester of Claim 1, wherein the carbamoyl ester has the following structure:



wherein:

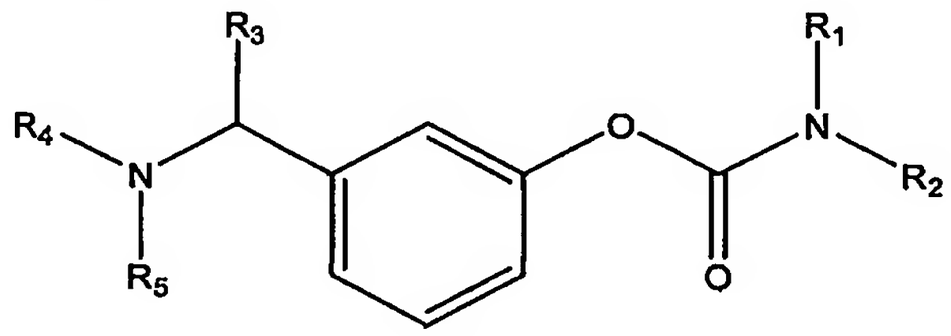
A is selected from the group consisting of an unsubstituted aryl, a

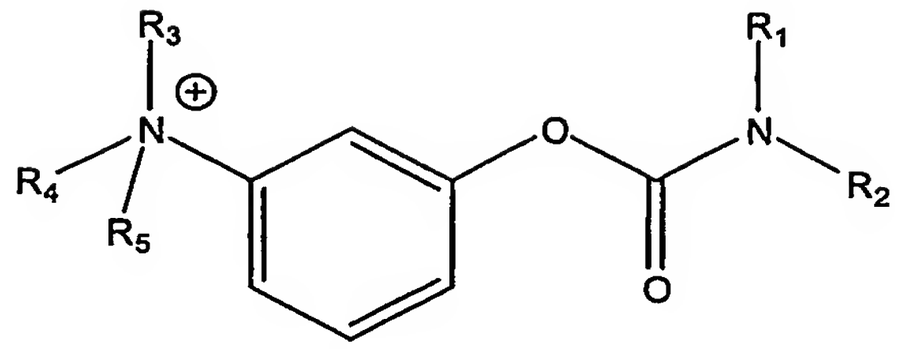
substituted aryl, an unsubstituted heteroaryl and a substituted heteroaryl; and

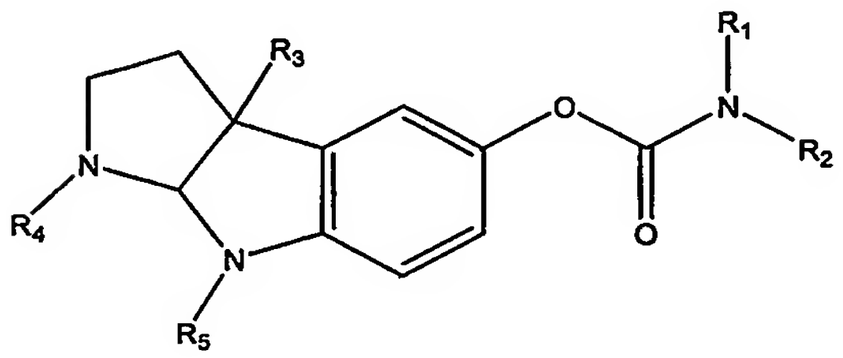
R_1 and R_2 are each, independently or in combination, selected from the group consisting of a hydrogen, an unsubstituted alkyl, a substituted alkyl, an unsubstituted aralkyl, a substituted aralkyl, an unsubstituted heteroalkyl, a substituted heteroalkyl, an unsubstituted heteroaralkyl, a substituted heteroaralkyl, an unsubstituted aryl, a substituted aryl, an unsubstituted heteroaryl, a substituted heteroaryl, an unsubstituted cycloalkyl, a substituted cycloalkyl, an unsubstituted heterocycloalkyl and a substituted heterocycloalkyl.

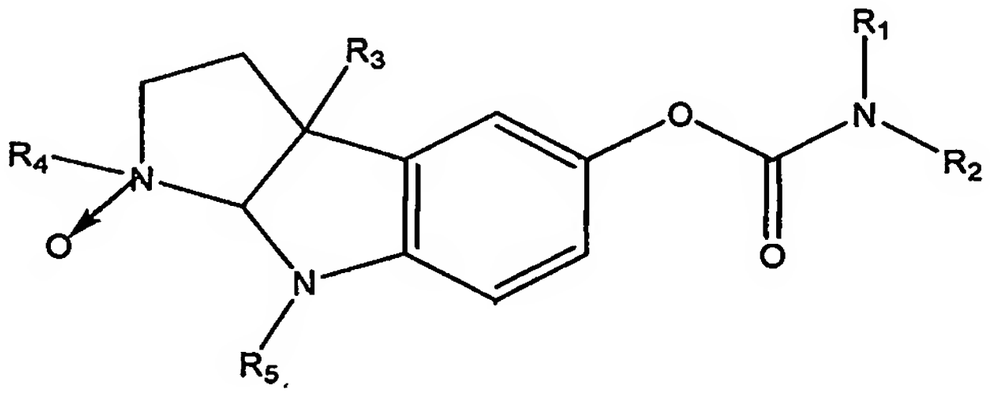
8. The carbamoyl ester of Claim 7, wherein the carbamoyl is not (3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro,-1, 3a, 8-trimethyl pyrrolo [2, 3-b]-indo-5-ol, 4-pyridinyl carbamate ester, (3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro-1, 3a, 8-trimethyl-pyrolo [2, 3-b] indol-5-ol,(2-phenyl) ethyl carbamate ester, (3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro-1, 3, 8-trimethyl-pyrolo [2, 3-b] indol-5-ol [1-(1-naphthyl)ethyl] carbamate ester, 7-bromo-(3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro-1, 3a, 8-trimethyl pyrrolo [2, 3-b] indol-5-ol, n-heptyl carbamate ester, or a tetrahydroisoquinolinyl carbamate ester.

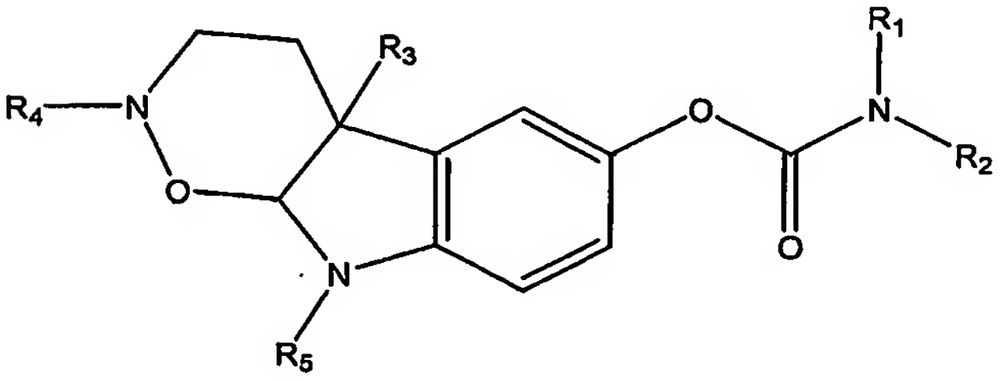
9. The carbamoyl ester of Claim 8, wherein the carbamoyl ester is selected from the group consisting of:











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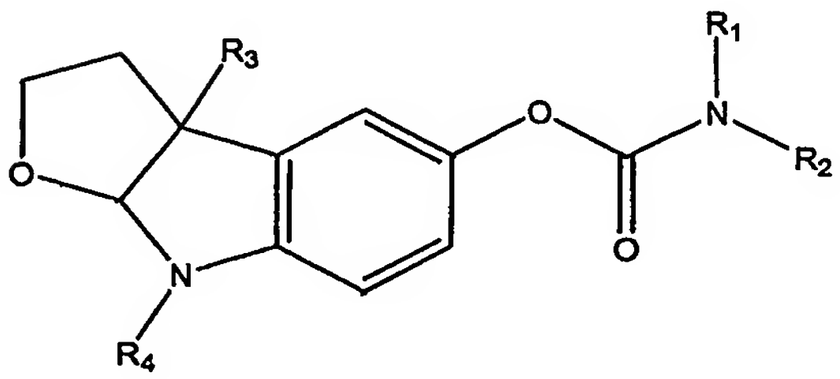
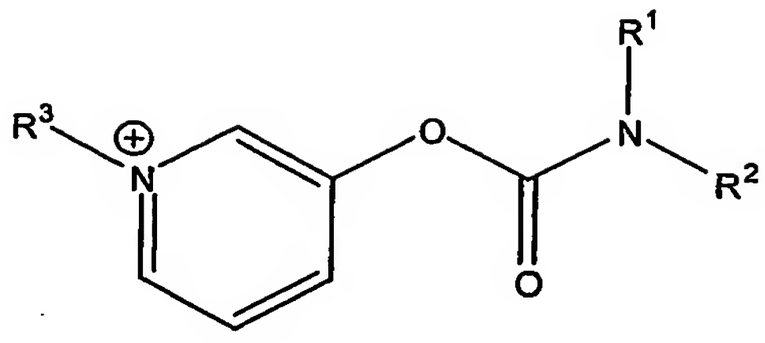
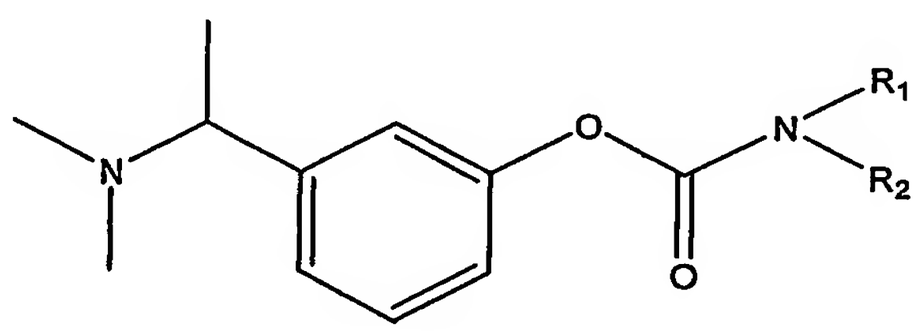


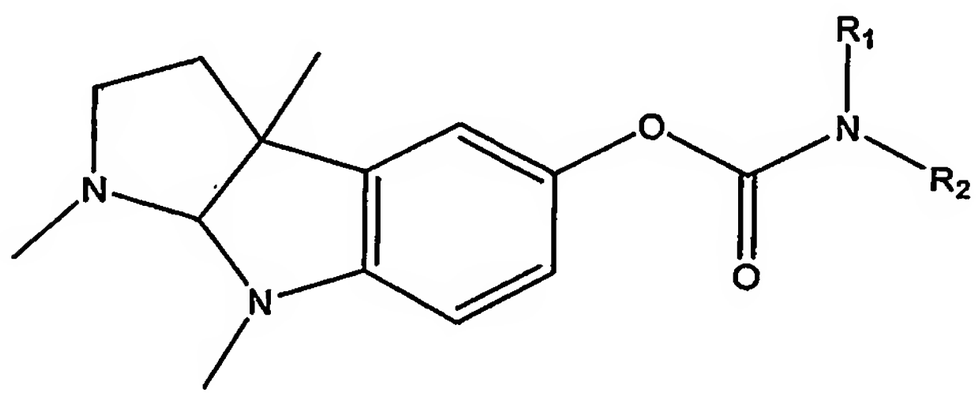
and

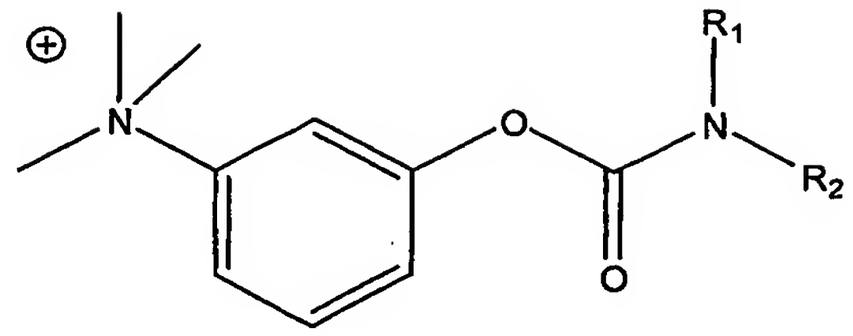


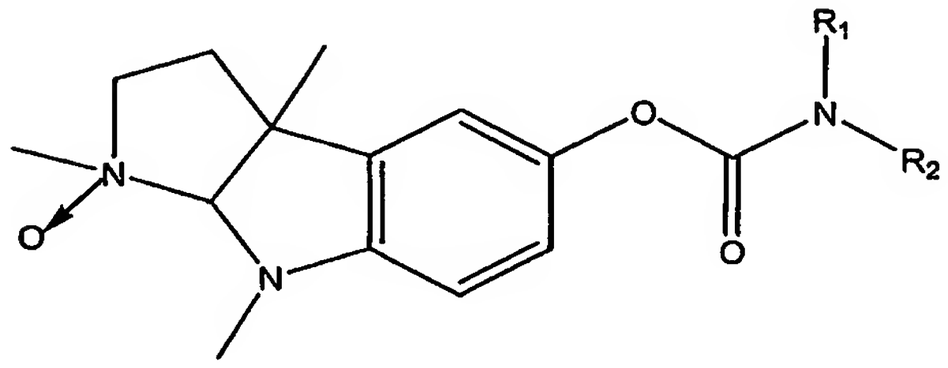
wherein R_3, R_4 and R_5 are each, independently or in combination, selected from the group consisting of a hydrogen, an unsubstituted alkyl, a substituted alkyl, an unsubstituted aralkyl, a substituted aralkyl, an unsubstituted heteroalkyl, a substituted heteroalkyl, an unsubstituted heteroaralkyl, a substituted heteroaralkyl, an unsubstituted aryl, a substituted aryl, an unsubstituted heteroaryl, a substituted heteroaryl, an unsubstituted cycloalkyl, a substituted cycloalkyl, an unsubstituted heterocycloalkyl and a substituted heterocycloalkyl.

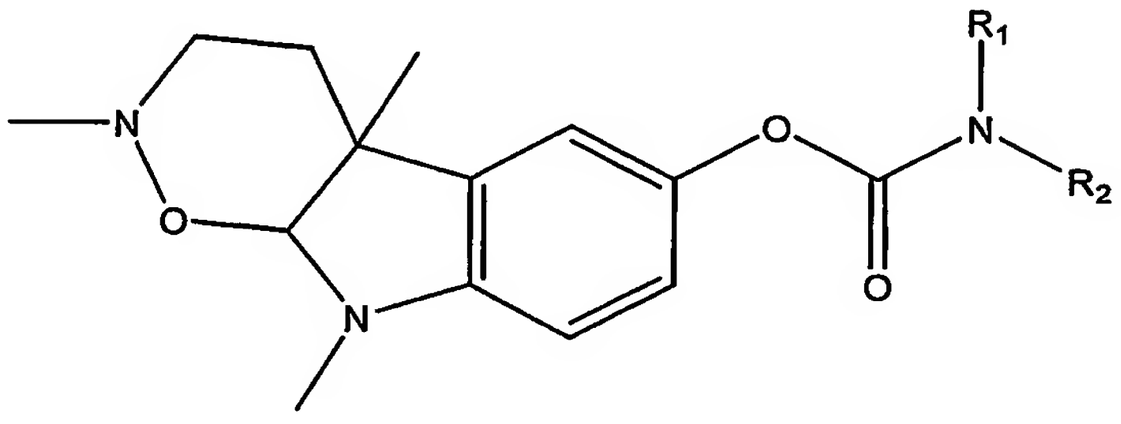
10. The carbamoyl ester of Claim 9, wherein the carbamoyl ester is selected from the group consisting of:











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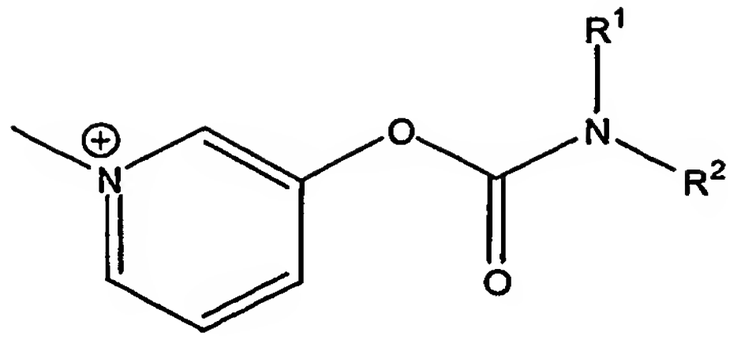
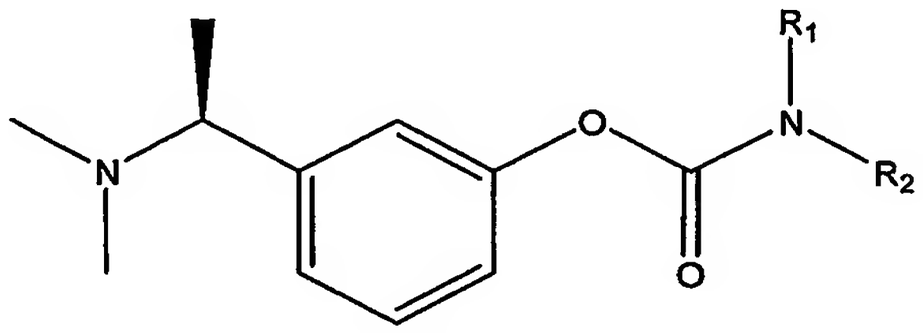
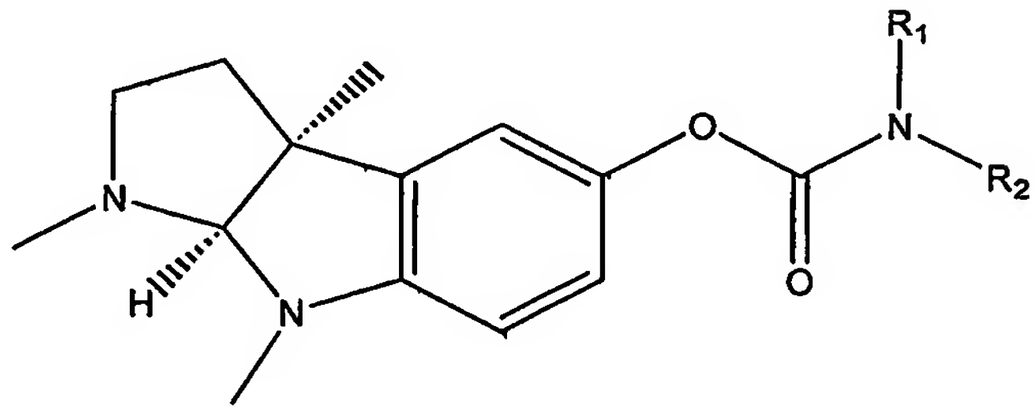
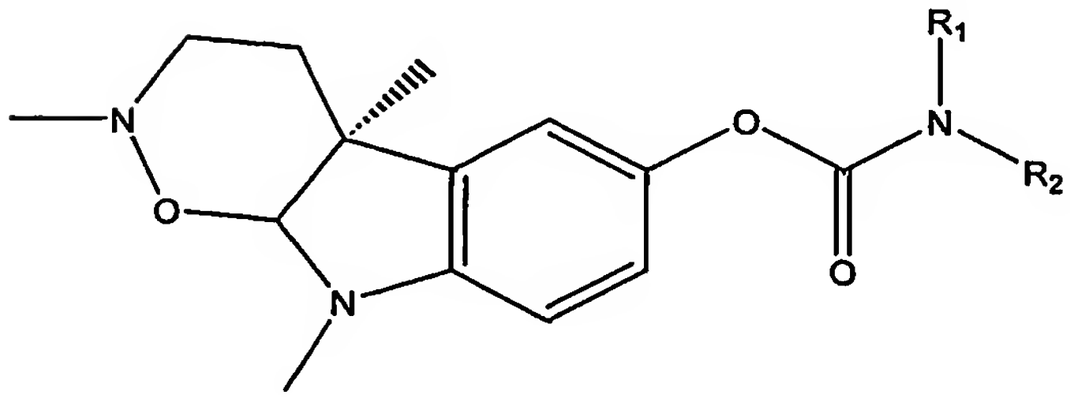


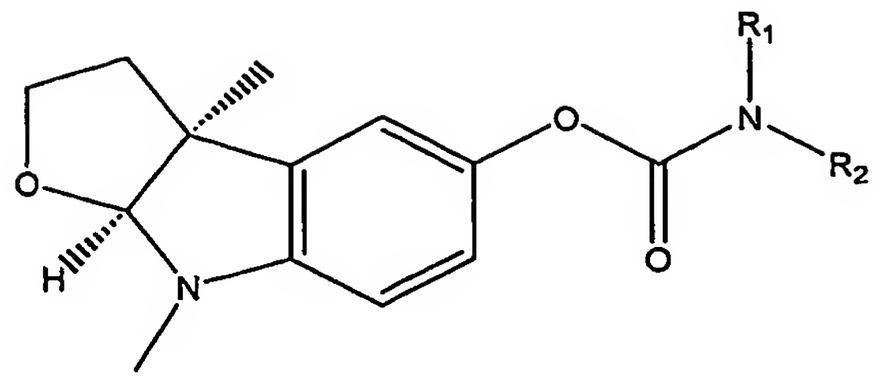
11. The carbamoyl ester of Claim 10, wherein the carbamoyl ester is selected from the group consisting of:







and



12. The carbamoyl ester of Claim 1, wherein the pharmacologically active agent is a central nervous system-type pharmacologically active agent.

13. The carbamoyl ester of Claim 12, wherein the central nervous system-type pharmacologically active agent is selected from the group consisting of a memory-facilitating agent and a cognition-facilitating agent.

14. The carbamoyl ester of Claim 1, wherein the pharmacologically active agent is an amphetamine compound.

15. The carbamoyl ester of Claim 14, wherein the amphetamine compound is an amphetamine.

16. The carbamoyl ester of Claim 14, wherein the amphetamine compound is a methamphetamine.

17. The carbamoyl ester of Claim 1, wherein the pharmacologically active agent is at least one member selected from the group consisting of a cholinergic agent, an adrenergic agent, a noradrenergic agent, a dopaminergic agent, a serotonergic agent, a glutamatergic agent, a GABAergic agent, a histaminergic agent, a mono-amine oxidase inhibitor, a COMT inhibitor, a beta secretase inhibitor, a gamma secretase inhibitor, a potassium channel blocker, a calcium

channel blocker, an adenosine receptor modulator, a cannabinoid receptor modulator, a nootropic, a neuropeptide pathway modulator, a neurotrophic, a PDE IV inhibitor, a phosphatase/calcineurin inhibitor, a receptor trafficking regulator, a trace amine receptor modulator, sodium/calcium exchange blocker, sigma receptor modulator, imidazoline receptor modulator, angiotensen converting enzyme inhibitors, antioxidants and non-steroidal anti-inflammatory drugs.

18. The carbamoyl ester of Claim 17, wherein the cholinergic agent is selected from the group consisting of an acetylcholinesterase inhibitor, a butylrylcholinesterase inhibitor, a cholinergic antagonist, a cholinergic agonist, an allosteric modulator of a cholinergic receptor and an open channel blocker.

19. The carbamoyl ester of Claim 17, wherein the adrenergic agent is selected from the group consisting of an alpha receptor agonist, a beta receptor agonist, an alpha receptor antagonist and a beta receptor antagonist.

20. The carbamoyl ester of Claim 17, wherein the noradrenergic agent is selected from the group consisting of a norepinephrine re-uptake inhibitor and a norepinephrine releasing agent.

21. The carbamoyl ester of Claim 17, wherein the serotonergic agent is selected from the group consisting a serotonergic antagonist, a serotonergic agonist, a serotonergic re-uptake inhibitor and a serotonin releasing agent.

22. The carbamoyl ester of Claim 17, wherein the glutamatergic agent is selected from the group consisting of an NMDA receptor agonist, an NMDA receptor antagonist, an NMDA glycine site agonist, an NMDA glycine site antagonist, an AMPA receptor agonist and an AMPA receptor antagonist.

23. The carbamoyl ester of Claim 17, wherein the GABAergic agent is selected

from the group consisting of a GABA receptor antagonist, a GABA receptor agonist, a benzodiazepine site agonist and a benzodiazepine site antagonist.

24. The carbamoyl ester of Claim 17, wherein the dopaminergic agent is selected from the group consisting of a dopaminergic antagonist, dopaminergic agonist, a dopaminergic re-uptake inhibitor, a dopaminergic releasing agent, dopamine and L-DOPA.

25. A method of treating an individual, comprising the step of administering to the individual a carbamoyl ester, wherein the carbamoyl ester inhibits a cholinesterase and includes an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent that treats the individual for a condition of the individual.

26. The method of Claim 25, wherein the pharmacologically active agent is at least one member selected from the group consisting of a cholinergic agent, an adrenergic agent, a noradrenergic agent, a dopaminergic agent, a serotonergic agent, a glutamatergic agent, a GABAergic agent, a histaminergic agent, a mono-amine oxidase inhibitor, a COMT inhibitor, a beta secretase inhibitor, a gamma secretase inhibitor, a potassium channel blocker, a calcium channel blocker, an adenosine receptor modulator, a cannabinoid receptor modulator, a nootropic, a neuropeptide pathway modulator, a neurotrophic, a PDE IV inhibitor, a phosphatase/calcineurin inhibitor, a receptor trafficking regulator and a trace amine receptor modulator.

27. The method of Claim 25, wherein the condition of the individual that is treated by the pharmacologically active agent is at least one condition selected from the group consisting of a central nervous system condition, a peripheral nervous system condition and an autonomic nervous system condition.

28. The method of Claim 27, wherein the central nervous system condition is at

least one condition selected from the group consisting of Parkinson's disease, a memory impairment and a cognitive impairment.

29. The method of Claim 28, wherein the memory impairment is in a human associated with at least one condition selected from the group consisting of Alzheimer's disease, age-associated memory loss, an impairment in memory consolidation, an impairment in short term memory, mild cognitive impairment and multiple sclerosis.

30. A method of treating a nervous system condition in an individual, comprising the step of administering to the individual a carbamoyl ester, wherein the carbamoyl ester inhibits a cholinesterase thereby treating the nervous system condition in the individual and wherein the carbamoyl ester includes an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent that further treats the nervous system condition in the individual.

31. A method of treating a central nervous system condition in an individual, comprising the step of administering to the individual a carbamoyl ester that inhibits acetylcholinesterase thereby treating the central nervous system condition in the individual, wherein the carbamoyl ester includes an amine group that, upon hydrolysis, becomes at least one component of a pharmacologically active agent, wherein the pharmacologically active agent is selected from the group consisting of an amphetamine compound and a methamphetamine compound, whereby the pharmacologically active agent further treats the central nervous system condition in the individual.

32. The method of Claim 31, wherein the amphetamine compound is an amphetamine.

33. The method of Claim 31, wherein the methamphetamine compound is a

methamphetamine.

34. A method of increasing acetylcholine in an individual, comprising the step of administering to the individual a carbamoyl ester, wherein the carbamoyl ester inhibits a cholinesterase, thereby increasing acetylcholine and includes an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent that further increases acetylcholine in the individual.

35. A method of increasing acetylcholine in an individual, comprising the step of administering to the individual a carbamoyl ester that inhibits acetylcholinesterase, thereby increasing acetylcholine in the individual, wherein the carbamoyl ester includes an amine group that, upon hydrolysis, becomes at least one component of a pharmacologically active agent, wherein the pharmacologically active agent is selected from the group consisting of an amphetamine compound and a methamphetamine compound.

36. A method of treating a cholinergic deficiency in an individual, comprising the step of administering to the individual a carbamoyl ester, wherein the carbamoyl ester inhibits a cholinesterase thereby treating the cholinergic deficiency in the individual, and wherein the carbamoyl ester includes an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent that further treats the cholinergic deficiency in the individual.

37. The method of Claim 36, wherein the cholinergic deficiency in the individual is Alzheimer's disease.

38. A method of treating an impairment in memory in an individual, comprising the step of administering to the individual a carbamoyl ester, wherein the carbamoyl ester inhibits a cholinesterase thereby treating the impairment in

memory in the individual, and wherein the carbamoyl ester includes an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent that further treats the impairment in memory in the individual.

39. The method of Claim 38, wherein the impairment in memory in the individual is at least one member selected from the group consisting of an impairment in memory consolidation, an impairment in long-term memory and an impairment in short-term memory.

40. The method of Claim 38, wherein the individual is a human.

41. The method of Claim 40, wherein the impairment in memory is associated with at least one condition selected from the group consisting of Alzheimer's disease, age-associated memory loss, mild cognitive impairment and multiple sclerosis.

42. The method of Claim 38, wherein the pharmacologically active agent is an amphetamine compound.

43. The method of Claim 42, wherein the amphetamine compound is an amphetamine.

44. The method of Claim 42, wherein the methamphetamine compound is a methamphetamine.

45. A method of delivering a pharmacologically active agent to a tissue, comprising the step of administering to the tissue a carbamoyl ester, wherein the carbamoyl ester inhibits a cholinesterase and includes an amine group that, upon hydrolysis , becomes at least a component of a pharmacologically active agent, thereby delivering the pharmacologically active agent to the tissue.

46. The method of Claim 45, wherein the tissue is in a human.

47. The method of Claim 45, wherein the pharmacologically active agent is an amphetamine compound.

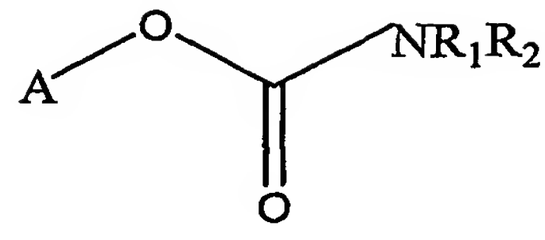
48. The method of Claim 45, wherein the pharmacologically active agent is a memory-facilitating agent.

49. The method of Claim 45, wherein the pharmacologically active agent is a cognition-facilitating agent.

50. The method of Claim 45, wherein the pharmacologically active agent is at least one member selected from the group consisting of a cholinergic agent, an adrenergic agent, a noradrenergic agent, a dopaminergic agent, a serotonergic agent, a glutamatergic agent, a GABAergic agent, a histaminergic agent, a mono-amine oxidase inhibitor, a COMT inhibitor, a beta secretase inhibitor, a gamma secretase inhibitor, a potassium channel blocker, a calcium channel blocker, an adenosine receptor modulator, a cannabinoid receptor modulator, a nootropic, a neuropeptide pathway modulator, a neurotrophic, a PDE IV inhibitor, a phosphatase/calcineurin inhibitor, a receptor trafficking regulator and a trace amine receptor modulator.

51. A pharmaceutical composition comprising a carbamoyl ester that inhibits a cholinesterase, wherein the carbamoyl ester includes an amine group that, upon hydrolysis, becomes at least a component of a pharmacologically active agent.

52. The pharmaceutical composition of Claim 51, wherein the carbamoyl ester has the following structure:



wherein:

A is selected from the group consisting of an unsubstituted aryl, a substituted aryl, an unsubstituted heteroaryl and a substituted heteroaryl; and

R_1 and R_2 are each, independently or in combination, selected from the group consisting of hydrogen, unsubstituted alkyl, substituted alkyl, unsubstituted aralkyl, substituted aralkyl, unsubstituted heteroalkyl, substituted heteroalkyl, unsubstituted heteroaralkyl, substituted heteroaralkyl unsubstituted aryl, substituted aryl, unsubstituted heteroaryl, substituted heteroaryl, unsubstituted cycloalkyl, substituted cycloalkyl, unsubstituted heterocycloalkyl and substituted heterocycloalkyl.

53. The pharmaceutical composition of Claim 52, wherein the carbamoyl is not (3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro,-1, 3a, 8-trimethyl pyrrolo [2, 3-b]-indo-5-ol, 4-pyridinyl carbamate ester, (3aS-cis)-1, 2, 3, 3a, 8, 8a hexahydro-1, 3a, 8-trimethyl-pyrolo [2, 3-b] indol-5-ol,(2-phenyl) ethyl carbamate ester, (3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro-1, 3, 8-trimethyl-pyrolo [2, 3-b] indol-5-ol [1-(1-naphthyl)ethyl] carbamate ester, 7-bromo-(3aS-cis)-1, 2, 3, 3a, 8, 8a-hexahydro-1, 3a, 8-trimethyl pyrrolo [2, 3-b] indol-5-ol, n-heptyl carbamate ester, or a tetrahydroisoquinolinyl carbamate ester.